

## ABSTRACT

1           A thin discontinuous layer of metal such as Au, Pt, or Au/Pd is  
2 deposited on a Group III-V material surface. The surface is then etched in a  
3 solution including HF and an oxidant for a preferably brief period, as little as a  
4 couple seconds to one hour. A preferred oxidant is  $H_2O_2$ . Morphology and light  
5 emitting properties of porous Group III-V material can be selectively controlled as  
6 a function of the type of metal deposited, doping type, doping level, metal  
7 thickness, whether emission is collected on or off the metal coated areas and/or  
8 etch time. Electrical assistance is unnecessary during the chemical etching of the  
9 invention, which may be conducted in the presence or absence of illumination.

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